Application No.: 10/019,068 Docket No.: PVZ-007US

REMARKS

Claims 13-41 are pending in the application. Claims 17, 19, 29, 37, and 41 have been amended and new claim 42 has been added to correct the multi-dependencies of claim 17. Accordingly, claims 13-42 will be pending upon entry of the instant amendment. No new matter has been added.

The foregoing claim amendments should in no way be construed as acquiescence to any of the Examiner's rejections, and have been made solely to expedite the prosecution of the application. Applicant reserves the right to pursue the claims as originally filed or as previously pending in this or in one or more separate applications.

Rejection of Claim 34 Under 37 CFR 1.75(c)

Claim 34 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. Specifically, multiple dependent claim 34 depended from multiple dependent claim 17. Claim 17 has been amended to remove the multiple dependencies. Thus, this objection no longer applies to the claims as currently amended. Accordingly, Applicant respectfully requests that the above rejection be reconsidered and withdrawn.

Rejection of Claims 19, 20, 29, 30, 37, 38, and 41 Under 35 U.S.C. 112, Second Paragraph

Claims 19, 20, 29, 30, 37, 38, and 41 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant submits that these claims have been amended and this section 112 rejection no longer applies for the following reasons.

The Examiner has rejected claim 19 because the "degree symbol was omitted after '22'." Claim 22 has been amended to include the omitted degree symbol. Therefore, this 35 U.S.C. §112, second paragraph, no longer applies to claim 19 as amended.

With regard to claims 30 and 37, the Examiner states that "[c]laim 30 raises an ambiguity as the weight ratio range cited therein contradicts the weight ratio range in claim 29 from which this claim depends, thus rendering the scope of protection indefinite and confusing for both these claims. It seems that the intent may have been for claim 29 to define "2:1 to 1:3", but clarification is required (the claim will be interpreted as such for the purposes of this office

action, as this seems to be the most reasonable way to reconcile these conflicting claims with each other and with the remainder of the disclosure). This same ambiguity is presented by claim 38 which contradicts the weight ratio range in claim 37.

Applicant respectfully submits that claims 30 and 37, as well as the specification, have been amended to correct this inadvertent typographical error. Accordingly, Applicant respectfully requests that this 35 USC §112, second paragraph rejection be reconsidered and withdrawn.

Turning now to the rejection of claim 41, the Examiner alleges that "[c]laim 41 defines that the 'solid bodies are as defined as in claim 17' -claim 17 is however not directed to solid bodies, but rather is directed to a tire balancing composition. While this composition may include solid bodies, presentation of claim 41, directed to a composition kit, as dependent upon a claim directed to a composition (not in kit form) raises and ambiguity in determining the scope of the claim."

Applicant respectfully submits that claim 41 has been amended to explicitly state the average smallest dimension range in question, *i.e.*, 1-4 mm. In view of the amendment to claim 41, the Examiner is respectfully requested to reconsider and withdraw the foregoing rejection.

Rejection of Claims 13-17, 22-31 and 35-41 Under 35 U.S.C. §102(b)

The Examiner has maintained the rejection of claims 13-17, 22-31, and 35-41 as anticipated by over Kenney (US 4,304, 281) in view of Bedbeck (US 5,522,559). In particular, the Examiner asserts that -

> Kenney discloses a composition comprising a gel with solid bodies in the form of rubber crumb or sawdust. Further, the rubber crumb is at for example "10 mesh" which in light of the table in col. 9 would seem to have an average particle size well within the claimed range. This reference does not explicitly characterize the rubber particles in terms of "average smallest dimension"- it however would seem reasonable to expect the described screening to in essence be an indication of the smallest particle dimension since the screening process would be expected to pass or retain material based in large part on the smallest dimension –particles with an average dimension within the claimed range are therefore considered to have been taught by the reference.

Applicant respectfully traverses the foregoing 35 U.S.C. §102(b) rejection. For a prior art reference to anticipate a claimed invention in terms of 35 U.S.C. §102, the prior art must teach ***each and every element*** of the claimed invention. Lewmar Marine v. Barient, 827 F.2d 744, 3 USPQ2d 1766 (Fed. Cir. 1987). Applicant respectfully submits that Kenney fails to teach each and every element of the pending claims.

The presently claimed invention utilizes a visco-plastic gel as a medium in which solid bodies (the mass of which serves to balance the tire/rim assembly when mounted on an automobile) can move when required, while at the same time remaining in place when the vehicle is stationary. The non-Newtonian visco-plastic gel has the rheological property of normally being a stiff, elastic gel, but changes to become viscous liquid when subjected to shear forces greater than a certain value, known as the yield stress value of the gel. These shear forces are generated as a result of the vibrations experienced when the wheel assembly is out of balance. When the shear forces disappear as a result of balance being re-established, the gel becomes stiff again, thus fixing the solid bodies in the position they have attained.

Kenney describes a puncture sealing composition and makes no mention at all about its ability to balance a tire during its rotation while mounted on a car. Kenney is directed to a puncture sealing composition rather than a tire balancing composition.

Indeed Kenney appears to describe a gelled composition containing solid particles of the general size range as in the present invention. However, Kenney's gelled composition does not flow under gravity or under the forces generated in the tire while running (see the abstract). Kenney makes absolutely no mention of any visco-plastic properties of its puncture sealing composition, and therefore, provides no motivation for one of ordinary skill in the art to consider that such a composition would be able to balance a tire while running. In particular, if the gel material flows because of providing enough material to plug a hole in the tire, it will obviously not flow very far, at the most a few millimeters. Also, the hole plugging gel would have to be extremely viscous to enable it to plug a puncture reliably. In contrast, if a visco-plastic gel were used to plug a puncture or hole, it would change into a liquid form whenever subjected to shear forces, and likely start seeping out of the hole or puncture like toothpaste squeezed from a tube. Thus, it is clear that the requirements of a balancing composition and those of a puncture sealing composition run quite counter to one another. Accordingly, Kenney does not describe each and every element of the presently claimed invention as required by 35 U.S.C. §102.

The secondary reference, Bredbeck, relied upon fails to make up for the deficiencies of Kenney to arrive at the presently claimed invention. In particular, Bredbeck describes an apparatus for converting old tires (in the form of tire chips) into crumb rubber. Nowhere does Bredbeck teach a visco-plastic gel with solid particles to balance a tire while in motion.

For all the foregoing reasons, Kenney, in view of Bredbeck, fails to teach each and every element of claims 13-17, 22-31, and 35-41, and thus, Kenney does not anticipate the instant claims. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the foregoing 35 U.S.C § 102(b) rejection.

Rejection of Claims 13-17, 22-31 and 35-41 Under 35 U.S.C. §103(a)

The Examiner has maintained the rejection of claims 13-17, 22-31 and 35-41 under 35 U.S.C. §103(a) as being obvious over Kenney or in view of Bredbeck. Applicant respectfully traverses and requests reconsideration of this 35 U.S.C §103(a) rejection for at least the foregoing reasons.

As previously discussed, the present claims are directed to a visco-plastic gel as a medium in which solid bodies can move when required, while at the same time remaining in place when the vehicle is stationary. The mass of the solid bodies serves to balance the tire/rim assembly mounted on an automobile.

As discussed in the previous section, neither Kenney nor Bredbeck disclose a visco-plastic gel to balance the tire or rim assembly when mounted on an automobile. Kenney instead is directed to a gel which plugs a puncture or a hole in a tire and Bredbeck teaches apparatus for converting old tires into crumb rubber. Thus, Bredbeck does not provide the knowledge lacking in Kenney to arrive at the claimed invention. Neither Kenney nor Bredbeck teach that any solid particles, *e.g.*, rubber particles, would be able to move through a gel medium to provide a change in balancing action. Therefore, there would be not reason to combine the hole plugging invention of Kenney with the apparatus for converting old tires into crumb rubber to arrive at the present invention.

Moreover, the gel used in Kenney differs from the gel of present invention. For example, the Kenney gel is not visco-plastic just because it has the ability to flow. The characterization of a visco-plastic requires more detailed rheological information, such as, storage modulus, loss modulus and/or critical yield stress. There is no disclosure of these properties or

characterization of the gel in Kenney because Kenney is concerned with plugging holes, and not with balancing a tire.

Overall, the combination of Kenney and Bredbeck fails to establish a *prima facie* case of obviousness for the presently claimed invention since there would be no motivation for one of ordinary skill in the art at the time of the invention to have combined the teachings of these references and, even if combined, Kenney and Bredbeck fail to teach the claimed invention. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the present rejection.

Rejection of Claims 13-17, 22-31, and 35-41 Under 35 U.S.C. §102(b)

The Examiner has maintained the rejection of claims 13-17, 22-31, and 35-41 as anticipated by GB 2074955 (Uniroyal). Applicant respectfully traverses and requests reconsideration of this 35 U.S.C. §102(a) rejection for at least the foregoing reasons.

As discussed above, for a prior art to anticipate the claimed invention, the prior art must teach ***each and every element*** of the claimed invention. Lewmar Marine v. Barient, 827 F.2d 744, 3 USPQ2d 1766 (Fed. Cir. 1987). Applicant respectfully submits that Uniroyal fails to teach each and every element of the pending claims.

Briefly, the present invention utilizes a visco-plastic gel as a medium in which solid bodies (the mass of which is to serve to balance the tire/rim assembly when mounted on an automobile) can move when required, while at the same time remaining in place when the vehicle is stationary.

Uniroyal discloses a pneumatic tire that is able to run when flat by virtue of the presence of a so-called "emergency running support device" consisting of a fabric layer and a plastic layer, which further supported by a rubber envelope (see, *e.g.*, numbers 20-23 in the drawings). In effect, the device forms a second, inner pneumatic chamber which can remain inflated in the event the main tire chamber should become deflated.

In particular, the Examiner refers to Uniroyal's friction layer that is applied to the inside of the main chamber on the inner surface of the tread. This layer comprises a "viscosity stable gel" and the gel further contains what the reference terms "roller body particles". These roller body particles are composed of rubber powder, and glass or plastic beads (see, *e.g.*, numbers 17 and 18 in the drawings). Thus, these "roller body particles" act more or less as friction-reducing ball bearings to enable the "emergency running support device" to move freely across the inner

surface of the tire if required. Furthermore, there is no indication in Uniroyal that the "viscosity stable gel" is in fact *visco-plastic gel*. There is certainly no disclosure that the gel is able to or supposed to move around within the tire, nor that the particles are able to move through the gel. Clearly, if the gel material moves away from a certain area of the inside of the tire and, takes its "roller body particles" with it, they will not be able to provide a friction-reducing effect in that area and would defeat the intended purpose of the Uniroyal reference.

Moreover, Applicant wishes to clarify the term "viscosity stable gel" of Uniroyal and submits that this phrase refers to a gel that does not change its viscosity, *e.g.*, under stress, *which is the exact opposite of the visco-plastic gels used in the claimed invention.* Clearly, the purpose of the "viscosity stable gel" in Uniroyal is to act as a lubricant, and should obviously not change its viscosity appreciably under any circumstances, *i.e.*, it should be viscosity stable.

Uniroyal fails to teach or suggest each and every element of claims 13-17, 22-31, and 35-41, and thus, Uniroyal does not anticipate the presently claimed invention. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the foregoing 35 U.S.C. § 102(b) rejection.

Rejection of Claims 13-17, 21, 26-29, 39, and 40 Under 35 U.S.C. §103(a)

The Examiner has maintained the rejection of claims 13-17, 21, 26-29, 39, and 40 under 35 U.S.C. §103(a) as being obvious over Uniroyal. Applicant disagrees that the claimed invention would have been obvious to the ordinarily skilled artisan at the time it was made for at least the following reasons.

Applicant reiterates the substance of the remarks set forth above with respect to the section 102(b) rejection of claims 13-17, 21, 26-29, 39, and 40. Briefly, the Uniroyal reference fails to teach or suggest a visco-plastic gel as a medium in which solid bodies can move when required to balance a tire or rim, as well as remain in the same position when the tire or rim is stationary, *e.g.*, the vehicle is parked. The mass of the solid bodies serves to balance the tire/rim assembly when mounted on an automobile.

As discussed above, Uniroyal is directed to a pneumatic tire that is able to run when flat by virtue of the presence of a so-called "emergency running support device" consisting of a fabric layer and a plastic layer, which is further supported by a rubber envelope. Nowhere does Uniroyal disclose balancing a tire or rim mounted on an automobile, let alone using a visco-plastic gel as a medium which allows solid bodies to move through the gel when required to

balance the tire or rim. The same visco-plastic gel also allows the solid bodies to remain stationary when their weight is not required to balance the tire or rim or when the tire or rim is no longer in motion.

For at least the foregoing reasons, the teachings of Uniroyal fail to teach or suggest the presently claimed invention, and thus, fail to establish a *prima facie* case of obviousness. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the present rejection.

Rejection of Claims 13-16, 21, 26, and 31 Under 35 U.S.C. §102(b)

The Examiner has rejected claims 13-16, 21, 26, and 31 under 35 U.S.C. §102(b) in view of Gunther (US 4,981,608). Applicant respectfully traverses the foregoing 35 U.S.C. §102(b) rejection and respectfully submits that Gunther fails to teach each and every element of the pending claims.

In particular, the Examiner relies on Gunther for "a gel material that can include rubber or caoutchouc particles at a diameter 'equal to' 0.8 mm." Indeed Gunther does mention rubber, or more specifically, caoutchouc particles (see column 5, line 15); however, this substance differs greatly from the presently claimed invention. Gunther teaches a composition that is an aluminum-based gelling agent for gelling mineral oils and other liquid hydrophobic substances. This gelling agent is obtained by a reaction of a poly-oxo-aluminum stearate with a stoichiometric amount of 2-ethyl-hexanoic acid (see column 3). The central subject matter of Gunther appears to be reminiscent of the co-precipitated aluminum soaps of naphthenic and palmitic acids developed during the 2nd World War as gelling agents for gasoline. The resulting flammable gel being used in incendiary munitions such as firebombs and flame throwers and generically known ever since as "napalm" (from the naphthenic and palmitic acids used as constituents). Therefore, Gunther is not a technological field related to the presently claimed invention.

Moreover, caoutchouc is a natural rubber extracted from the latex sap from rubber trees and, since it is unvulcanized, is normally plastic, *i.e.*, not solid or elastic. Furthermore, caoutchouc is soluble in organic solvents. (See attached excerpt from The Merck Index, 13th Ed. enclosed.) These properties are reflected in Gunter at column 5, line 15 which indicates that the task of the caoutchouc is to absorb some, or perhaps all, of the mineral oil, *i.e.* to swell with the oil, and thereby effect an increase in viscosity (see col. 5, line 1-3).

Consequently, and quite apart from the fact that no mentioning is made of the resulting gels of Gunther being visco-plastic, the Gunther reference does not anticipate the presently claimed invention. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the section 102(b) rejection.

Rejection of Claims 13-16, 21, 26, and 31 Under 35 U.S.C. 103(a)

The Examiner has rejected claims 13-16, 21, 26, and 31 under 35 U.S.C. 103(a) as obvious over Gunther (US 4,981,608). Applicant disagrees that the claimed invention would have been obvious to the ordinarily skilled artisan at the time it was made for at least the reasons presented in the previous section.

Furthermore, Gunther fails to provide any reason why one of ordinary skill in the art would want to utilize a visco-plastic gel as a medium in which solid bodies can move when required, while at the same time remaining in place when the vehicle is stationary to balance the tire/rim assembly when mounted on an automobile

Accordingly, the teachings of Gunther fail to teach or suggest the presently claimed invention, and thus, fail to establish a prima facie case of obviousness. Accordingly, Applicant respectfully requests that the Examiner reconsider and withdraw the present rejection.

Rejection of Claims 13-33 and 35-41 Under 35 U.S.C. §103(a)

The Examiner has rejected claims 13-33 and 35-41 under 35 U.S.C. §103(a) as being unpatentable over Ronlan (US 5,431,726) in further view of Powell *et al.* (US 3,987,833), Clay (US 3,463,551), Fogal (US 5,073,217), and LeBlanc (US 6,128,952). Applicant disagrees.

To establish a *prima facie* case of obviousness, the cited references, in combination, must teach or suggest each and every claim limitation. Applicant submits that the Ronlan reference in combination with references Powell *et al.*, Clay, Fogal, and LeBlanc do not teach or suggest each and every claim limitation of the claimed invention. Neither Ronlan nor the secondary references teach or suggest a visco-plastic gel as a medium in which solid bodies that can move when required, while at the same time remaining in place when the vehicle is stationary.

Indeed Ronlan, which is the inventor's own work, discloses gels for balancing tires, but as admitted by the Examiner, Ronlan ***does not*** describe the inclusion of solid particles which can move through the visco-plastic gel to balance the tire/rim assembly when mounted on an automobile.

Furthermore, the secondary references (Powell *et al.*, Clay, Fogal, and LeBlanc) do not make up for the above-stated deficiencies in the primary references. These references combined with Ronlan do not teach or suggest the presently claimed invention, *i.e* . a visco-plastic gel as solid bodies used to balance the tire or rim assembly on an automobile.

Powell *et al. (US 3,987,833)* describe a method of balancing a tire by placing a localized layer of a polyolefin in liquefied hot state, *i.e.*, molten, that adheres to the inside of the tire by surface tension and then presumably hardens (see Fig. 1). Placing this layer of molten polyolefin on the inside of the tire occurs prior to mounting the tire on a rim. Powell *et al.* disclose the possibility of incorporating "a relatively heavy substance in finely divided particulate form" in the polyolefin (see col. 2, lines 25-30). The particles in Powell *et al.* are finely divided, *i.e.*, likely significantly smaller than 0.5 mm. However, it seems clear from this reference that the localized polyolefin layer is not intended, and indeed, not able to move after its application. Thus, this layer merely acts as a spread-out plastic version of the classical lead balancing weights. Moreover, Powell *et al.* has the added disadvantage that it can only compensate for imbalances in the raw, unmounted tire, *i.e.*, without the metal rim, and hence is unable to compensate for any imbalances inherent in the rim itself or due to slight eccentric mounting of the tire on the metal rim.

As a result, since the polyolefin layer cannot itself move and for obvious reasons, there are no teachings in Powell *et al.* that the heavy particles, which are merely filler, are able to move through the polyolefin layer and provide the more efficient balancing effect of the present invention. There is no inducement for the skilled artisan to combine Powell *et al.* with Ronlan.

Clay (US 3,463,551) describes a balancing composition, which may be "a viscous gel" which may comprise a weighting material (see col. 5, line 61). However, the composition system is quite complex and appears to include, firstly, a weighting material, secondly, a "*sustaining medium conveyor*", and thirdly, a "*positional retaining material*" (see column 5). Clay does not disclose a gel that incorporates a weighted material that is intended or indeed able to move around during the lifetime of the tire in response to changes in the balance of the wheel. Thus, the weighting material is fixed in location and merely adds weight and does not have the ability to move through the gel matrix.

With regard to Powell *et al.* and Clay the Examiner further states that

> [a]s to the size of the particles, neither Powell et al. nor Clay provide specific numeric limitations on the particle sizes to be

> used. It therefore would have been obvious for the artisan to determine an appropriate size through routine optimization based upon the necessary requirement that the material appropriate balance the tire, it further being obvious to look to analogous particle balancing systems that are known to be suitable and effective in this art to provide general guidance in this regard.

Applicant respectfully disagrees with the Examiner's remarks and submits that a skilled artisan would not know the effects of particle size on the ability of the particles to move through a visco-plastic gel matrix as opposed to surface forces acting on small particles. Moreover, the Examiner would not have known the effects of particle size on movement through the visco-plastic gel matrix without the benefit of the present application. Nowhere is there motivation for one of ordinary skill in the art at the time of the invention to have combined teachings of these references and, even if combined, Ronlan in view of Powell *et al.* and Clay fail to teach the claimed invention.

Secondary reference Fogal further fails to make up for the deficiencies of Ronlan. Fogal merely describes the use of a dry powder material as the balancing medium, apparently without any means of fixing it in whatever location it manages to move to during a an automobile drive. The powder will inevitably fall down to the bottom of the tire whenever the vehicle stops, *e.g.*, a traffic stop, and will then have to be re-distributed when the vehicle starts up again. Thus, the powder would not be much better than a free-flowing liquid such as water. Clearly, Fogal does not anticipate the invention, nor in combination with any of the references cited, including Ronlan, enable a skilled artisan to arrive at the presently claimed invention.

Secondary reference LeBlanc describes a balancing material consisting more or less entirely of glass beads which adhere to the inside of the tire solely by electrostatic forces. Specifically, the size of these glass beads is dictated by their ability to adhere to the inside of the tire. Thus, LeBlanc does not envisage that glass beads should be incorporated into a visco-plastic gel matrix as in the presently claimed invention. Therefore, there is no motivation from either LeBlanc or Ronlan to combine these references, and even if combined, they do not teach or suggest the presently claimed invention.

For at least the foregoing reasons, the teachings of Powell *et al.* (US 3,987,833), Clay (US 3,463,551), Fogal (US 5,073,217), and LeBlanc (US 6,128,952) fail to make up for the deficiencies in the teachings of the primary reference of Ronlan. Accordingly, the Examiner is respectfully requested to reconsider and withdraw this section 103 rejection.

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SUMMARY

In view of the above amendment, Applicant believes the pending application is in condition for allowance.

A request for an appropriate extension of time accompanies this Amendment, and Applicant believes no additional fee is due with this statement. However, if a fee is due, please charge our Deposit Account No. 12-0080, under Order No. PVZ-007US from which the undersigned is authorized to draw.

Dated: September 23, 2004

Respectfully submitted,

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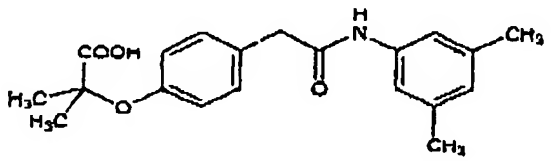
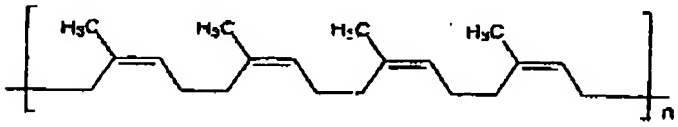


mp 85°.
THERAP CAT: Antineoplastic adjunct (radiosensitizer).

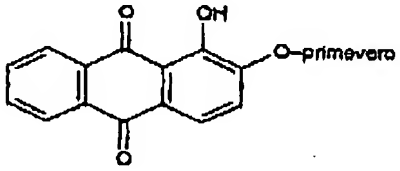
8359. Rubber. Caoutchouc; India rubber. $(C_5H_8)_n$. Primarily obtained by coagulating the milk juice (latex) of several tropical trees, chiefly *Hevea brasiliensis* Muell.-Arg., *Euphorbiaceae. Habit.* Brazil, East Indies, Java, etc. Rubber also occurs in a number of plants, among which *guayule* (*Parthenium argentatum* Gray), a shrub which grows primarily in the northern Mexican desert, represents a potentially useful renewable source. Guayule produces rubber which is chemically identical to *Hevea* rubber in amounts ranging from 10-20% (dry basis) distributed in the roots and stems. *See* E. Campos-Lopez, *J. Polymer Sci., Polym. Lett. Ed.* **14**, 649 (1976); *J. Polymer Sci., Polym. Chem. Ed.* **14**, 1561 (1976); J. D. Johnson, C. W. Hinman, *Science* **208**, 460 (1980). Possible biosynthesis from acetate through mevalonic acid and isopentenyl pyrophosphate: Archer *et al., Nature* **184**, 268 (1959). Comprehensive review of chemistry: Ellis, *Chem. Ind. (London)* **1962**, 1447. Book: L. G. Polhamus, *Rubber* (Wiley, New York, 1962). *Review:* Jirgenson's, *Natural Organic Macromolecules* (Pergamon Press, New York, 1962) pp 113-124; D. R. St Cyr in *Kirk-Othmer Encyclopedia of Chemical Technology* vol. **20** (Wiley-Interscience, New York, 3rd ed., 1982) pp 468-491. Natural rubber is defined as a *cis*-1,4-polyisoprene with a molecular weight varying from 100,000 to one million.



The best grades of raw rubber (pale crepe or smoked sheet) contain ~95% rubber hydrocarbon. The rest consists of proteins (2-3%), acetone-sol resins and fatty acids (2%), small amounts of sugar and a little mineral matter. Vulcanization, which consists of heating rubber with 1-3% of sulfur, introduces cross links between chains to produce a three-dimensional lattice of improved elasticity, strength, and temp sensitivity. Accelerators such as zinc dimethyldithiocarbamate greatly decrease the time or lower the temp required for vulcanization. Pure rubber is nearly colorless and transparent in thin layers; odorless and tasteless. It is very elastic and lighter than water. Dec at about 120°. Burns with smoky flame. Emits characteristic offensive odor while burning. Practically insol in water, alcohol, dil acids, or alkali; sol in abs ether, chloroform, most fixed and volatile oils, petr ether, carbon disulfide, oil of turpentine.

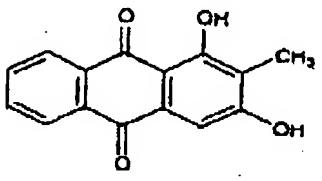
8360. Rubeanic Acid. [79-40-3] Ethanedithioamide; dithiooxamide. $C_2H_4N_2S_2$; mol wt 120.20. C 19.99%, H 3.35%, N 23.31%, S 53.35%. $NH_2CSCSNH_2$. Review of rubeanic acid

8361. Ruberythric Acid. [152-84-1] 1-[6-*O*-β-D-xylopyranosyl-β-D-glucopyranosyl)oxy]-9,10-anthracenedione; 1-hydroxy-2-anthraquinonyl 6-*O*-β-D-xylopyranosyl-β-D-glucopyranoside; β-2-alizarin primeverosidic acid; rubian; rubianic acid. $C_{25}H_{26}O_{13}$: C 56.18%, H 4.90%, O 38.92%. Isoln from roots of *Rubia tinctorum* L., *Rubiaceae:* Hill, Richter, *Proc. Roy. Soc. Ser. B* **121**, 547 (1937). Structure: Richter, *J. Chem. Phys.* **5**, 1701. Synthesis: Zemplén, Bognár, *Ber.* **72B**, 1460 (1939). Metabolism: Maehner, Dulce, *Z. Klin. Chem. Klin. Biochem.* **6**, 1 (1968).



Golden-yellow, silky, lustrous prisms or long needles, mp 259-261° (from water). Sol in hot water, alkali, hot alc, ether. Practically insol in benzene.

8362. Rubiadin. [117-02-2] 1,3-Dihydroxy-2-methyl-9,10-anthracenedione; 1,3-dihydroxy-2-methylanthraquinone. $C_{15}H_{10}O_4$; mol wt 254.24. C 70.86%, H 3.96%, O 25.18%. From *Rubia tinctorum* L., *Coprosma* var., *Morinda* Linn, *Rubiaceae:* Schunck, *Ann.* **87**, 344 (1853); Perkin, *J. Chem. Soc.* **1949**, 1241; Briggs *et al., ibid.* 1951; Borvie, Cooke, *Aust. J. Chem.* **15**, 332 (1962). Marchlewski, *J. Chem. Soc.* **63**, 1137 (1893). Schunck, Marchlewski, *ibid.* **65**, 182 (1894). Jones, Robertson, *ibid.* 1949. Synthesis: Joshi *et al., J. Sci. Ind. Res.* **14B**, 87 (1955); *Chem. Pharm. Bull.* **8**, 417 (1960).



Yellow plates from glacial acetic acid, mp 302°. Under plates from alc, mp 290°. Absorption max (ethanol): 280, 415 nm (log ε 4.39, 4.52, 3.87). Sol in alc, hot acetic acid; practically insol in water, alkalies.
Diacetate. Yellow rods from acetic anhydride.
Dimethyl ether. Yellow needles from alc, mp

8363. Rubidium. [7440-17-7] Rb; at. wt 85.47; valence 1. Group IA (1). Alkali metal. Widely distributed in very small quantities in earth's crust: 0.0034%. Naturally occurring isotopes: 85 (72.15%); 87 (27.85%, radioactive, $T_{1/2}$ 4.88×10^{10} yr, β^- emitter. Artificial (mass nos.): 74-102. Found with other alkali metals (borate), *lepidolite* (aluminosilicate), *rubidium carnallite* (chloride); in sea water; in mineral springs and salt lakes. Discovered by Bunsen and Kirchhoff in 1861. Prepn: Hackspill, *Chim. Acta* **11**, 1003 (1928). *Review:* Whaley, "Potassium, Rubidium, Cesium and Francium" in *Comprehensive Inorganic Chemistry* vol. **1**, J. C. Bailar Jr. *et al.*, Eds. (Pergamon Press, Oxford, 1973) pp 369-529; *Chemistry of the Elements*, N. Greenwood, A. Earnshaw, Eds. (Pergamon Press, Oxford, 1984) pp 75-116; F. S. Wagner in *Kirk-Othmer Encyclopedia*